Gambro Renal Products
Technical Assistance Services

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Technical Update

WATER,PR,10039 – 10/5/2004

PROCEDURE

Equipment Type: WRO100/CWP

Subject: Abbreviated CWP Membrane Cleaning Procedure

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Purpose:
The Cleaning Procedure for the WRO/CWP as presented in the Operator's and Service Manual can be time consuming. Many times, an abbreviated procedure could produce similar results. This tech tip will describe an abbreviated procedure that can be quickly performed at the end of the treatment day. It is intended to be done as a maintenance cleaning or in cases where there is minimal loss of membrane performance. In cases where there is severe loss of performance, it may be more appropriate to use the full procedure as described in the CWP Operator and Service manual. This procedure differs from the procedure outlined in the manual in the following ways:

- Valves 41 and 71 are not fully opened, eliminating the requirement for recalibration prior to the use of the CWP.
- The dwell period for the cleaning chemical is the standard ½ hour dwell that is part of the disinfection / rinse cycle, not a manual 2-3 hour dwell.
- The chemical pump fuse is removed instead of turning the pump rate to zero. This eliminates the need to recalibrate the chemical disinfect uptake.
- This procedure takes less than ½ hour at the end of the treatment day, as opposed to 4-5 hours when performed as described in the manual. This simplifies regular cleaning of the membranes and makes it easier to coordinate the cleaning with clinic operations.

This Tech Tip will:

1. Define the tools and materials needed to perform the cleaning procedure
2. Present the indications for cleaning the WRO/CWP elements
3. Clarify the steps required for the cleaning procedure
4. Establish criteria for evaluating the effectiveness of the procedure

Tools and Materials:

The membrane cleaning procedure will require the following tools and materials-

1) Approved cleaning chemicals
2) Mixing container larger than 1 gallon
3) Stirring/mixing rod
4) Flexible gooseneck funnel
5) Dry weight measuring device for measuring cleaning chemical
6) Graduated cylinder for measuring liquid

Indications for Cleaning Membranes:

1) Permeate production has dropped by 10% or more from original values
2) Permeate conductivity has increased steadily over time
3) Reject rate has decreased by 10% or more from original values
4) High pressure pump pressure has increased steadily over time
5) Approved manufacturer or Gambro PM procedure criteria for membrane cleaning are met

Procedure:

Record the critical operating parameters of the RO unit. Items to be recorded are:

1. Pure Water flow rate
2. Permeate conductivity
3. Percent Rejection
4. P1 pump pressure (optional)

The procedure for either high or low pH membrane cleaning is the same. It is only the chemical used that differs in the procedures. The steps include-

1) Advise clinical staff that the cleaning procedure will be performed that night. They will be required to replace the DOS connector in the "Operate" position and enter the Operator Code 813 before pressing the "Start" button in the morning. This is what is normally required after any "Disinfection" cycle and the clinical staff should be familiar with the procedure. <u>The CWP will not AUTOSTART in the morning following this cleaning procedure and the clinical staff should be prepared to perform the steps needed after any disinfection cycle</u>. (This may entail the staff coming in a little earlier to manually start the CWP in the morning.)
2) Place a sign on the CWP operator panel stating the type of cleaning chemical that has been added to the CWP and the type of residual test that must be performed as per the cleaning chemical manufacturer's recommendations. Ensure that there are test strips or other residual test devices available for the staff in the morning.
3) Fill a large mixing container with approximately 4 liters of warm pretreatment or permeate water.
4) Follow the cleaning chemical's manufacturer guidelines or Gambro's Operator and Service Manual mixing guidelines for that specific chemical.
5) Thoroughly mix the chemical until it is completely dissolved.
6) Remove the fuse from the lower left hand side of the proportioning pump to disable it. Mark the "pump rate" dial's position with marker or tape for future resetting.
7) Begin a "Disinfection" cycle per procedure.
8) After the "Valve Test Before" cycle is completed, (This takes 6 minutes. The Screen will have counted down from 132 minutes to 126 minutes) SLOWLY pour the cleaning solution into the Inlet Water Tank using the gooseneck funnel.

9) Allow the Disinfection Cycle to complete by itself. It is not mandatory to remain to observe the cycle completion. The Disinfection Cycle will complete as it normally does and rinse itself out.
10) Clinical staff should perform residual chemical tests per manufacturer recommendations and restart the CWP in the morning.
11) Replace the fuse in the proportioning pump and reset the "speed" dial to the marked position if necessary.

Evaluation of Cleaning Procedure:

1) Record the same RO operating parameters as done before the cleaning procedure was begun.
2) These measurements should approach or equal the same values as documented when the RO unit was installed.
3) Should the new values show improvement, it may be necessary to run the cleaning procedures again until the cleanings do not improve performance. This would then indicate that the maximum benefit from cleaning has been achieved. It may also be necessary to try an alternate cleaner. For example, if an acid cleaning was performed and there was no performance improvement, then an alkaline cleaning may be performed.
4) Should there be no improvement in performance, there may be other factors affecting the CWP (calibrations, failures etc). Call Technical Support at 1-800-525-2623 for further assistance.